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THE YEAR 1937 in the Telephone Industry

By STANLEY R. EDWARDS
Editor, TELEPHONY

IN MANY WAYS, 1937 was a year of recovery and expansion in the telephone field. All-time peaks in number of subscribers were exceeded by many Independent companies and likewise by the Bell System, as a whole. To take care of the increased service and traffic requirements, additional switchboard and plant equipment were necessary in some sections of the country. In other sections, due to various conditions, some companies showed little if any net increase in subscribers throughout the year.

New apparatus and equipment were produced by manufacturers along the line of making service more convenient to the subscriber and instruments more harmonious with their surroundings. Technical improvements and research work combined to develop more efficient equipment. Much progress was made toward commercial use of new subscriber and central office equipment.

New applications were developed of the use of broad bands of frequencies for multi-channel transmission over existing circuits; there were improvements in radiotelephony while many betterments were made in the detail of apparatus, circuits and methods. Successful trials were made of the coaxial cable system in multi-channel telephone transmission and transmission of television images.

Bell plant construction included a new section of transcontinental line —the largest construction project since 1930—a number of new telephone buildings and other increased exchange and toll facilities.

Everywhere was apparent recognition of changing conditions and situations which require careful leadership to maintain progress and stability. Public relations were improved and the excellent employe relations of past years continued. There were also important improvements in commercial, traffic and construction methods.

Station Gains and Toll Calls in 1937

On the basis of gains in telephone stations, 1937 was an excellent year. The first six or seven months saw increases much greater than in the corresponding months of 1936. During latter months of the year, the recession slowed down the rate of station gains but the total number of telephone stations of the Bell System by November 1 had exceeded the peak reached in November, 1930.

The total increase in Bell System

stations for 1937, it is estimated, will be about 880,000. This estimated gain would make the total of Bell telephones in service at the end of the year 15,350,000, the greatest number in its history. This compares with the previous high point of 15,193,000 in November, 1930.

The total number of telephones in service in the country approximated 19,490,000 at the end of the year. It is interesting to note that of this total only 72,000 stations do not have connection with the Bell System long distance network. Of this number about 38,000 telephones are operated by one company group and the remainder divided among about 135 small companies.

The percentage of station gain was about the same as last year. The rate of gain in the Bell System was approximately 6 per cent while the average gain of the Independents was about 4 per cent. This difference was undoubtedly due to the Independents operating in smaller towns where recovery from the depression was not as marked as in the larger cities in which the greater number of Bell telephones are located; the increase in Bell installations being mainly for business purposes as compared with residential installations in the smaller places.

The number of toll calls completed in the United States during 1937 showed an increase of 8 per cent over the preceding year. The total was about the same as the number completed in 1931, according to preliminary estimates. The following table gives the estimated number of toll and long distance calls completed by Bell and Independent companies during each of the last eight years:

1930	1,078,000,000
1931	1,000,000,000
1932	850,000,000
1933	760,000,000
1934	790,000,000
1935	825,000,000
1936	935,000,000
1937	1,000,000,000

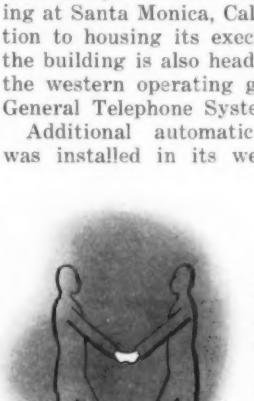
Expenditures for Plant and Buildings

The telephone industry did its share in 1937 in expending money for making replacements, additions and betterments. In the Independent field a number of new buildings were constructed and new switchboard equipment installed, while the outside plant was rebuilt in many cases. The Bell System planned to spend more than $300,000,000 during 1937 for this work. That compared with $243,347,000 in 1936 and $195,000,000 in 1935.

In 1929 the expenditure was $633,000,000, and in 1930 an expenditure of $700,000,000 was contemplated but was reduced to $585,000,000. It is expected that in 1938 the Bell will spend more than in 1937.

The Associated Telephone Co., Ltd., completed construction of a three-story office and exchange building at Santa Monica, Calif. In addition to housing its executive offices, the building is also headquarters for the western operating group of the General Telephone System.

Additional automatic equipment was installed in its west Los Angeles office and an addition to the switchroom is now under construction with 1,600 lines of equipment to be installed upon its completion.



"Public relations were improved and the excellent employe relations of past years continued."

The net increase in plant investment in 1937 was $1,518,000 and for 1938 it is estimated it will be $1,726,000. The company now serves nearly 96,000 stations, approximately 12 per cent more stations than its previous high record.

Undoubtedly the Independent companies will continue the rehabilitation of plant and in taking care of maintenance which was deferred for several years during the depression, especially if general business conditions show indications of improvement.

Bell System buildings were recently constructed or under construction in: New Haven, Conn., headquarters building; Buffalo, N. Y., two two-story exchange buildings; Washington, D. C., four-story exchange building; Atlanta, Ga., one-story exchange building; St. Paul, Minn., seven-story exchange and office building; Detroit, Mich., two-story exchange building.

Corpus Christi, Texas, three-story exchange building; Indianapolis, Ind., one-story exchange building; Frankfort, Ky., Long Lines repeater station, one story; Cincinnati, Ohio, two-story exchange building; Norwood, Mass., two-story exchange building; Cleveland, Ohio, two-story exchange building; Philadelphia, Pa., two-story exchange building; and San Francisco, Calif., two-story exchange building.

Small Exchanges Going to Individual Ownership

In several states there was more evidence of the recognition by several company groups, which resulted from the buying wave during the late '20s, that some small exchanges which had been purchased could not be efficiently operated as a group unit. This is indicated by the number of small single exchanges sold during the year to individuals, who took over their operation and management.

Independent and Bell Relationships

The relations of the Independent and Bell groups of the industry continued harmonious throughout the year. Cooperation between them in the handling of teletypewriter and other Bell special services was greatly strengthened through the agreement, reached late in the year at conferences between representatives of the United States Independent Telephone Association and the A. T. & T. Long Lines department, providing for additional compensation to Independents for their participation in handling these services.

The agreement for increased compensation for these services removes one of the differences which has existed between the two groups for approximately ten years. It is believed that the new compensation will, to a considerable extent, make up to the Independent companies any decrease in revenue suffered through the loss of message tolls due to teletypewriter service installations.

The special committee of the United States Independent Telephone Association, which made the study of adequate compensation for the Bell special services, has been continued by President John H. Agee. Undoubtedly, it will extend its studies to cover compensation contracts in the different states for the handling of message toll business, in addition to analyzing the results of the new compensation schedule for the special services.

In a case of an individual company, in which the matter of compensation for handling tolls was taken into the courts, the Bell company was unable to sustain its contention as to the contract covering compensation. The court held for the Independent company by dismissal of

the suit brought against the Jamestown (N. Y.) Telephone Corp. by the New York Telephone Co. directing the jury to bring in a verdict of "no cause for action."

In directing the verdict, Chief Justice Parton Swift of the New York Supreme Court, eighth district, took the position that the New York Telephone Co. was relegated to its action upon a *quantum meruit* for services. Through this decision, in any subsequent court action which the New York company may bring for collection of any amount claimed for toll compensation from the Jamestown company, the burden of proof would be upon the Bell company to prove the reasonableness of its allowances to the Jamestown company as compensation for handling the Bell's toll business.

National Association Continues Varied Activities

Although routine activities of the United States Independent Telephone Association were carried on continuously throughout the year, the sudden death in January of the association's president, F. B. MacKinnon, caused an interruption in its special work. With the election of John H. Agee, vice-president of the Lincoln (Neb.) Telephone & Telegraph Co., as president in February and the selection in April of Louis Pitcher, vice-president and manager of the Dixon (Ill.) Home Telephone Co., as executive vice-president to devote his entire time to the activities of the Chicago office, the association's work was resumed on all fronts. Alfred L. Geiger, general attorney, continued his effective work in the association's Washington office.

Due to deaths, retirements and changes in the number of directors, the membership of the association's board now includes many of the younger executives of the industry. Their enthusiasm for and activity in association affairs during the year have added greatly to its strength and accomplishments. The board of directors is now representative of the various groups and interests within the Independent industry and all are working in effective harmony, a condition brought about largely through the efforts of President MacKinnon, who passed away before the results were apparent.

In May the association's executive committee adopted a resolution on depreciation. The resolution set forth the association's position relative to depreciation and expressed willing cooperation with the Federal Communications Commission and all state commissions in dealing with this important matter. The association's position was briefly stated as comprised of seven points.

At the same meeting at which this resolution was adopted, a special committee on depreciation was appointed by President Agee. This committee, at the annual convention in October, presented a report concerning its study of the subject to the board of directors. In this report it was stated:

"The committee is opposed to and will neither sponsor nor forward any system or plan designed to provide, at the expense of the telephone users, depreciation in excess of that needed for the replacement and modernization of the plant, but it believes that the regulatory bodies as well should be zealous in seeing that the amount provided is not inadequate for the constant and continuous improvement of the telephone service in this country, so that it can and will continue to be the best in the world.

The committee believes that the American public prefers highly efficient telephone service above cheap service made possible at the expense of the cessation or retardation of the development of communication by telephone."

The association's special committee on fire insurance credits to rural subscribers made a final report in June to President Agee. The report stated that recognition has been given to telephones as an integral part in the prevention and fighting of farm fires by stock fire insurance companies in 13 states. These companies now publish a reduced rate on farm fire insurance, subject, among other things, to the farm having a telephone.

The committee recommended that the project be taken over by the association as an organization undertaking. The association is now working out a plan to carry out the committee's recommendation. The states of Illinois and Michigan, in which several communities have complete rural fire departments, have been selected as territories in which to further the work.

Association efforts will be limited to one community in each state in an effort to work out an efficient plan of procedure, to create interest among the farmers of the possibility of getting reductions in their fire insurance rate and to meet the requirements of the insurance companies. Once started in these communities, it is believed the movement will spread to other communities in these states and, in turn, to other states.

Telephone service of the small rural companies was jeopardized during the year with the ruling of Administrator John M. Carmody of the Federal REA relating to electric lines financed by the REA. The national association immediately joined with the state associations in efforts to have the electric organizations share the costs of metallicizing grounded telephone lines involved.

At the national convention held in October, a resolution prepared by the directors, was adopted pledging the complete cooperation of the national association with the state associations in obtaining justice for the small rural telephone companies.

State Associations and Independents' Problems

The different state associations had a year full of varied activities. The associations in the mid-western states, where grounded telephone systems are common in the rural territory, in addition to routine matters, had the problem of rural electrification.

In practically all states rising costs of operations have been a matter of association discussion. In Minnesota, members of the railroad and warehouse commission met with a number of the members of the Minnesota Telephone Association in July. The commission learned at first hand of the many problems of the smaller companies caused by increased taxes, moving of poles on highways, increased costs of materials and various other expense-creating influences which are entirely beyond control of company management.

The annual conventions of the various state associations as well as the district meetings were more largely attended than for several years past. While reports were made generally of increased number of telephones in service, concern was expressed that the revenue increase due to installation of these telephones

Telephone Service Is a Great Responsibility

"As the business of the telephone company is to serve the public, loyalty to the public becomes the supreme motive of the telephone man . . . We are not engaged in a game, but a business, a profession—one in charge of the nervous system of the nation.

The business men of the country do not realize this—that it is a great responsibility. They must be made to understand that the telephone employes are men and women of a superior training and ability and are rendering a great service to their country and to their fellow men."—F. B. MacKinnon, late president of United States Independent Telephone Association.

would be more than offset by the rising costs of operation.

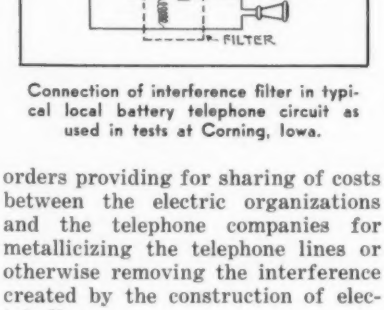
The REA and Grounded Telephone Lines

The cooperation existing between the telephone companies and power companies in various states, in the construction of electric lines in rural territory, was seriously disturbed during the year through a ruling in May of Administrator John M. Carmody of the Federal REA in Washington in declaring that the various REA state projects would not bear or share any costs of metallicizing rural grounded telephone lines when paralleled by REA cooperative lines.

Representatives of the United States Independent Telephone Association and seven state associations, at a conference in Washington with REA officials in early July, presented the serious situation which was created among the small rural telephone companies as a result of Mr. Carmody's drastic order. They were advised that recommendations would be made to Mr. Carmody by the REA representatives.

Commissions in several states, where grounded telephone lines form the usual type of construction in the rural districts, in the course of electric line construction in these districts, had issued rules governing the sharing of costs in eliminating inductive interference on the telephone lines. Mr. Carmody requested the Iowa commission to rescind its order of 1916 requiring electric utilities to bear the cost of metallicizing grounded telephone lines when paralleled by power circuits. The state commission after a hearing ruled against REA cooperatives by only slightly modifying its order.

No change was made in the rules of the Wisconsin commission while North Dakota, Nebraska, Kansas, Oklahoma and Minnesota have issued



Connection of interference filter in typical local battery telephone circuit as used in tests at Corning, Iowa.

orders providing for sharing of costs between the electric organizations and the telephone companies for metallicizing the telephone lines or otherwise removing the interference created by the construction of electric lines.

The Minnesota commission, in a specific case, requires the electric cooperative to pay some $600 as its share of the costs of metallicizing the telephone lines. This is to be paid before the electric lines of the cooperative are energized.

Mr. Carmody, however, has not as yet rescinded his drastic order. It is, therefore, assumed that work on rural electrification projects, in such states where commissions have provided for sharing the costs of metallicizing telephone lines when paralleled by electric lines, will be held up until Mr. Carmody makes provision for sharing costs or takes court action to determine federal authority over state authority.

Minimizing Interference on Grounded Lines

A demonstration or test of a new method for minimizing inductive interference on grounded lines was made in Iowa in September. Capacitors, or condensers as they are known in the telephone field, were placed across the line windings of the main supply transformer bank on a recently-constructed multi-grounded wye type rural line. An interference filter, which was inserted in the receiver circuit in the telephone, was also used.

The combination of these two devices was successful in greatly reducing the noise on the telephone line. The telephone line with these devices connected was not as quiet as it was before the electric line was built. It is thought, however, that these devices will prove useful in many inductive interference cases.

FCC and Its Work Affecting Telephone Industry

The Federal Communications Commission is more and more settling down to its normal and routine work in the regulation of telephone companies. It continued during the year its determination of Independent companies coming fully under its jurisdiction. In one or two cases, where the commission ruled an Independent company to be fully under its jurisdiction by reason of the Bell holding its bonds or stocks, appeals were made from the rulings and the cases were carried over into the new year.

On the whole, in the cases decided, the commission rulings upheld the companies' contentions that they were not fully subject to the FCC's jurisdiction.

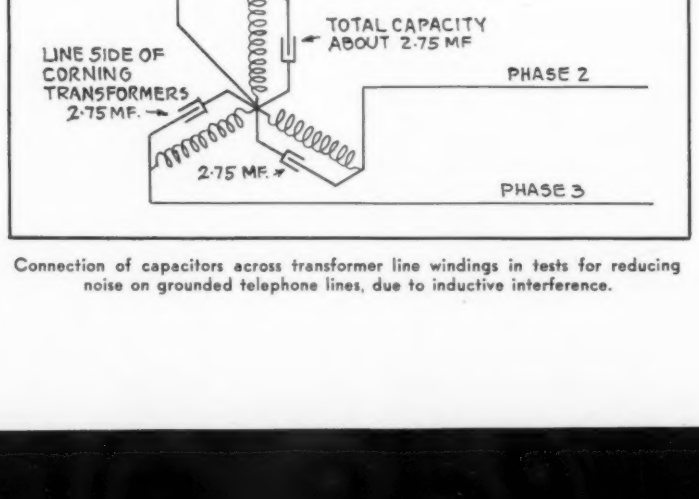
The special investigation of the Bell System was completed with hearings that concluded June 30. Since then members of the commission staff have been at work on the report, with recommendations, that is to be made to Congress. It is expected that the report will be presented early this year.

During the late fall the new chairman, Frank R. McNinch, announced several important changes in the organization of the FCC and methods of carrying on its work. While the changes have not been in effect long enough to judge results, apparently they are based upon sound ideas. They should increase the commission's efficiency and also remove many of the causes of criticisms that have been made against former FCC practices and procedures.

The commission is also greatly strengthened by the appointment of T. A. M. Craven, whose technical and practical experience, especially in radio, should be of great value.

Accounting Systems for Smaller Companies

The matter of uniform systems of accounting has been one in which companies and associations in several states were much interested dur-



Connection of capacitors across transformer line windings in tests for reducing noise on grounded telephone lines, due to inductive interference.

ing the year. The state commissions in adopting systems of accounting for telephone companies are following generally the FCC's system. Several of the commissions are now considering accounting systems for the Class C companies.

The proposed uniform system of accounting for Class C companies of the Federal Communications Commission, which some state commissions are considering adopting, is opposed by many of the smaller companies that have studied it. They declare it is too complicated, expensive and contains unnecessary requirements and that the benefits derived from it are not sufficient to warrant the time and money to install and maintain it.

The executive committee of the United States Independent Telephone Association went on record in opposition to it by adoption of a resolution declaring it not in the best interests of the companies and that the results from its installation will be far from commensurate with the burdens imposed.

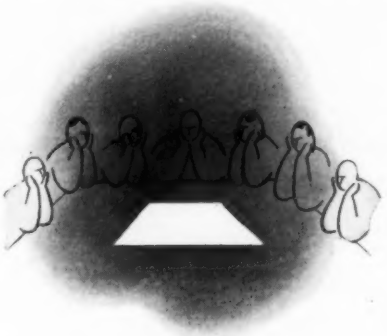
Regulatory Commissions and Telephone Rates

In the activities of the various state regulatory commissions, the trend toward making rate adjustments by conferences between commission members and company officials became pronounced during the year. Several cases of reductions in rates by Bell companies were brought about by means of conferences rather than long-drawn out cases with formal hearings before commissions. A number of Independent companies also had their rate differences adjusted in the same manner. In several states Independent companies were allowed increases in rates, due to higher operating costs, by their regulatory commissions.

The decision of the New York Public Service Commission in November authorizing the Rochester Telephone Corp. to increase its local rates was based almost entirely upon the company showing adverse effect of the rising tide of taxes upon its operations. The company showed that the county, city and federal taxes will be almost twice and the state taxes four times as great in 1938 as in 1928.

Increases in operating expenses of telephone companies are, in the main, due to causes over which the companies have no control. Governmental requirements regarding pole moves due to highway improvements, minimum wage laws, limited hours of employment, social security and unemployment taxes are responsible for a great increase in operating expenses. The pronounced rise in taxes will become more apparent to various companies during the ensuing year.

The trend toward reduction in or elimination of the extra monthly charge for handset instruments continued during the year. The Bell companies which have handsets as the larger percentage of instruments in service have generally eliminated the charge. Where other type sets are in the majority, the charge has been reduced. Most Independent companies having handsets as only a small percentage of their total instruments in service are allowed to continue the handset charge.



"In the activities of the various state regulatory commissions, the trend toward making rate adjustments by conferences between commission members and company officials became pronounced during the year."

The number of Bell rate cases before courts and commissions that have been carried for several years has decreased.

Extended Area Service for Metropolitan Centers

Extended area service, which was introduced in Los Angeles, Calif., more than a year ago, has been taken up in other sections of the country. This is seen in the recent order of the Illinois Commerce Commission as applying between Chicago and suburbs, and in the announcement by the Michigan Public Utilities Commission the middle of last month of extended area service to suburbs of Detroit.

In extended area service, suburban communities are given connection to adjacent areas without payment of individual message tolls or at a reduced toll where formerly the full toll as charged for calls to city downtown offices was collected. In other words, extended area service seeks to enlarge the scope of telephone availability for residents of smaller communities which surround a metropolitan center.

Deaths Cause Many Personnel Changes

The year, 1937, registered the deaths of more prominent men in the telephone industry than any other year during the past quarter century. Some of them were still active at their death; others had partially retired retaining connections which did not require their full-time attention, while still others had been retired for several years. The mortality rate was considerably greater among Independent telephone men than the Bell group. The Independents included men who had been active for many years among the leaders in both operating and manufacturing fields.

A list appearing on page 14 gives the names of those who were active in state and national affairs among the Independents, and also men in the Bell group who had been prominent.

The many changes in the Independent group, due to deaths of these leaders and of many others in executive positions in the operating field, emphasize the opportunities which the industry offers to the younger men with the proper qualifications—experience, knowledge and ability. The new year sees a number of Independent companies under the active direction of comparatively young men who have been advanced to responsible positions following years of training and experience in varied positions in the industry.

The Year With Independent Manufacturers

Independent manufacturers, on the whole, had a satisfactory year. The increase in the number of telephone stations served by operating companies together with the operating companies getting away from their tendency of the past few years to limit purchases to actual necessities, created considerable activity in the purchasing of new plant equipment, both inside and out.

Sales by manufacturing companies, of both equipment and supplies, therefore, were particularly good throughout most of the year. There was a strong resumption of buying of switchboards and equipment and also of the new styles of subscriber sets. Many plans made by operating companies, which had been deferred during the preceding years, matured in 1937 and orders were placed with the Independent manufacturers. This was true of both small and large exchanges.

Renewed interest on the part of

smaller operating companies in automatic equipment, in the situations where such equipment fits in, resulted in extensions of the manufacturers' lines of small switching equipment, as well as increased flexibility in the various types available. It is also interesting to note the announcement of one manufacturer that it has developed a relay automatic system to offer to its customers, in addition to the manual equipment which it supplies.

During the year one Chicago manufacturer announced the construction of a new $1,000,000 factory and office building, which testifies to its faith in the continued growth of the Independent industry. The new plant will be in operation during the early months of the new year.

The Independent manufacturers are studying and analyzing the trends of the times and their effects upon telephone conditions. The many changes in equipment and subscriber sets by manufacturers clearly show that Independent operating companies can supply their customers with whatever telephone equipment or facilities they may wish.

Improvements in Subscribers' and Exchange Equipment

Recognizing the trend toward telephone mobility in residential service, a new type plug and jack was brought out by one Independent manufacturer. This company suggests that Independent operating companies may substantially increase their revenue by offering to subscribers the convenience of transferring a telephone set from one room to another through the use of plug and jack equipment.

Along this line may be mentioned the activity of one large Independent operating company in suggesting to architects in its territory that they include in plans for new residences provision for adequate telephone wiring. The response has been so notable, and the resulting business so profitable to the company, that the calling on architects with wiring suggestions has been made a part of the regular work of this company's commercial department.

For a number of years the Bell System has cooperated with architects in providing suggestions for

NAMES OF SOME OF PROMINENT TELEPHONE MEN WHO DIED IN 1937

F. B. MacKINNON, of Chicago, Ill. (January 10), was president of the United States Independent Telephone Association for nearly a quarter century.

EDGAR L. BREENE, Seattle, Wash. (January 26), general traffic manager of The Pacific Telephone & Telegraph Co. in Washington and Idaho.

W. W. STRAIGHT, of Crooks, S. D. (February 7), secretary and manager of the Crooks Telephone Co.; vice-president and a past president of the South Dakota Telephone Association.

EDWIN F. HILL, of Washington, D. C. (February 20), publicity director of the Chesapeake & Potomac Telephone Co. and in charge of the 24-hour press information service for the American Telephone & Telegraph Co., had a service record with the Bell System of 37 years.

JOHN C. KOONS, of Washington, D. C. (April 12), vice-president of the four Chesapeake & Potomac telephone companies since 1923 and first assistant postmaster general of the United States during the World War.

HAROLD E. BRADLEY, of Harrisburg, Pa. (May 14), president of the Pennsylvania State Telephone & Traffic Association, was actively engaged in telephone work for 39 years and engaged in directing traffic and association work for 35 years; former president of Independent Pioneer Telephone Association.

M. M. BORMAN, of Abercrombie, N. D., a past president of the North Dakota Telephone Association, active in its organization in 1906; owner of the Abercrombie Telephone Co.

WILLARD H. MORRISON, of Ashtabula, Ohio (June 1), was active in the formation of the old National Independent Telephone Association and an organizer of the Ashtabula Telephone Co. in 1897; director and member of its executive committee for 40 years until his death.

ALBERT E. SMITH, of Indianapolis, Ind. (June 7), was general commercial superintendent of the Indiana Bell Telephone Co. almost the entire time since its organization in 1920.

H. L. HARRIS, of Chicago, Ill. (August 10), executive, engineer, pioneer and an international figure in the telephone business for 41 years; best known for his executive direction of the manufacturing and sales companies, both domestic and foreign, of the Gary group; was president of Automatic Electric Co. and of the Associated Telephone & Telegraph Co. at time of his demise.

CHARLES H. MOORE, of Bowling Green, Ky. (September 6) president of the Kentucky Independent Telephone Association, for many years Kentucky manager of the Southern Continental Telephone Co.

WALTER J. UHL, of Logansport, Ind. (September 29); well known throughout the Independent field for his work in the Indiana Telephone Association and its predecessor and also in former National Independent Telephone Association; founder of Logansport company in 1901 and general manager since organization.

FRANK A. KNAPP, of Bellevue, Ohio (October 25), president and founder of the Northern Ohio Telephone Co. in 1897; an outstanding figure in the Independent field for 40 years; former president of Ohio Inde-Telephone Association and former vice-president of U. S. Independent Telephone Association; former president of Independent Pioneer Telephone Association.

W. G. BROREIN, of Tampa, Fla. (December 12), veteran Independent pioneer; founded the Peninsular Telephone Co. 36 years ago and served as its president since that time; served as president of the Florida Telephone Association from its organization in 1906, director and officer of the United States Independent Telephone Association for many years as well as a member of its executive committee.

F. A. STEVENSON, of Croton-on-Hudson, N. Y. (December 17), retired assistant vice-president of the American Telephone & Telegraph Co., took an important part for about 35 years in the development of long distance telephone service to its present world-wide scope.

EUGENE S. WILSON, of New York, N. Y. (December 19), a vice-president of the American Telephone & Telegraph Co. since 1920, was a specialist in regulatory laws affecting telephone and telegraph communication; served as legislative agent for the A. T. & T. for many years.

location of telephones so that wiring may be installed when residences are under construction. Through the installation of telephone outlets in every room at convenient locations, when residences are under construction, extension telephones may be placed where wanted and easily transferred by the subscriber from one location to another by means of the plug and jack equipment.

Along the line of improvement of the telephone ringer so that it may be heard at a greater distance and yet the sound be not jangling or nerve-wracking, this same manufacturing company has made a change in its instrument design to effect this result. It has developed a new resonance chamber in its self-contained handset or combination set. This has made a distinct improvement in increasing the ringing so that it is heard more clearly in various parts of the residence.

In the improvements of operators' telephone equipment, this same manufacturer developed a new breastplate operators' set with a lightweight non-positional transmitter and a featherweight operators' receiver. The entire set weighs 6⅜ ounces. A new bakelite front has been developed for its non-positional handset transmitter, enabling it to be used with a desk or wall set.

In the switchboard developments of this company, announced late in the year, was a new automatic switchboard of the relay type for small exchanges. A new small magneto board and a junior non-multiple switchboard, together with a new line of steel-frame PBX switchboards, were also developed by this manufacturer, all with modern lines and compactness of equipment.

New Handsets and Subscriber Equipment

A new self-contained handset desk telephone, for use on both dial and manual service, was brought out by another manufacturer. The more conventional style of desk set was observed in the design of this new set in order to avoid obsolescence that occurs in some designs. The phenolic compound exterior of the set is along modern artistic lines.

Phenolic compound was also used for the exterior of a new wall type set equipped with a handset. This is designed to give service on either a manual or dial exchange. Special attention was given to the styling of the outer case of this wall telephone to give it a pleasing appearance.

The same manufacturer developed a high speed PBX cord circuit with many features to provide rapid and personalized service necessary in large industrial plants. Where both local communication and central office service are required from the same telephone and the number of calls is not great enough to require a PBX operator, a simplified common talking, selective ringing telephone system with two trunks and ten lines was developed, which is similar to the manufacturer's other system having six local lines and two trunks. It provides additional line capacity and also space for mounting of dial when used in connection with the dial exchanges.

This system permits selective ringing of any local telephone in addition to answering, holding, transferring or originating central office calls.

Also in the developments of the year of this manufacturer is a switchboard to provide improved common battery service in large rural communities. The unique feature of the switchboard is a four-relay universal cord circuit for manual ringing and a six-relay cord circuit for machine ringing with an automatic ringing trip on either the silent or the ringing period.

Another development is a new ringing interrupter of simplified design to operate at lower cost. A simple method is provided for operating the interrupter from a battery source in cases of emergency.

A bell box of small size with a plastic cover was announced by one Independent manufacturer. It is so designed that it can be used as the base for a handset type instrument when an operating company changes to that type set.

Subscriber Station Accessories; Rotor Relay Equipment

Another Independent manufacturer developed a new telephone cord with built-in elasticity for use with handsets. It stretches easily to over twice its original length. The reception given this cord by operating companies and their subscribers has revealed the need for a handset cord that will not get tangled with desk equipment.

The cord instantly and automatically adjusts itself to any position the user may assume and contracts immediately when the handset is replaced on its saddle. Undoubtedly telephone companies will make increasing use of this type of cord, probably as an extra service item.

A device brought out by this same manufacturer is designed to simplify calling on automatic systems of persons whom the user calls most frequently. Known as Autodial, all that is required is to set a pointer opposite the name of the desired person on a list of those frequently called. A lever is then pushed or released and the Autodial does the dialing. Time and effort are thus saved in dialing and the necessity of looking up or remembering numbers is eliminated.

A newly-developed multi-contact

(*Please turn to page* 22)

NEW MEMBERS OF FEDERAL COMMUNICATIONS COMMISSION

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In the Nation's Capital

By FRANCIS X. WELCH

Special Washington, D. C., Correspondent for TELEPHONY

THE PRESENT RECESSION and the course President Roosevelt is taking concerning it; political phases of the situation. . . . Reaction of the public with respect to the foreign situation has been mixed and rather disappointing to the State Department. . . . Holiday season brings lull in activities of FCC

THOSE who were fortunate enough to witness the original production of Marc Connelly's "Green Pastures" will remember to their dying day the trustful and loving expressions spread on all the dusky faces of "de Lawd's angels" as they stood by in silent wonderment and waited for him to "pass a miracle" to fix up some things that happened to go wrong even in Paradise.

Well, with all due respect, that's the expression one sees on the faces of the devout New Dealers in Washington these days when you talk to them about the "recession" (many government stenographers have to be warned not to confuse that word "recession" with "depression").

Of course, President Roosevelt has quite a reputation for "passing miracles" since he came on the Washington scene in the turbulent days of March, 1933. He passed so many miracles in such dazzling succession that it was not generally noticed or realized that some of them didn't turn out so well. Even the spectacular crack-up of the Blue Eagle could be blamed on the Supreme Court. Recovery was the principal miracle of the First New Deal for which the principal character took an appropriate bow. ("We planned it that way and don't let anyone tell you differently.")

ALL OF WHICH explains the trustful confidence of the faithful followers when the present recession became too obvious and pressing to ignore or laugh off. Reacting to this confidence last fall, the President followed his usual program of preparing to pass not one but four big miracles to stem the tide of recession and bring back the familiar strains of "Happy days are here again." (For details on the "big four" see the President's message to the opening of the special session.)

The special session has come and gone and it is clear to all that the old routine isn't clicking. The more doubtful disciples are beginning to ask questions, but the great rank and file of the faithful are still standing around and waiting for the leader to end the suspense and confound the heretics with his great powers over the natural forces of economy.

Will he be able to make good? Well, it would be presumptuous for your correspondent, who is supposed to confine his comments to observable trends and activities, to say definitely that he will not. But this much we can say with some sort of foundation: So far the President has been following almost step for step the measures adopted by former President Hoover when the great depression really grew upon us in 1930.

First of all, you will recall that Mr. Hoover was inclined to pooh pooh the talk of a long siege of depression. It was mostly "psychological," he said, and pointed to cheerful statistics manufactured for him by various hopeful agencies. Compare this with President Roosevelt's pre-Christmas discussion about the "psychology of fear" which he hinted was more newspaper talk than anything else.

Next, Mr. Hoover called in the big industrialists, utility leaders, and such. From them he obtained reassuring commitments of large spending for new construction to relieve unemployment and break the back of the depression. Compare this with the recent "peace" conferences that have been taking place at the White House between the President and the various utility heads.

The third step by Hoover (once he became convinced that we really had a depression and not a delusion) was to take a persistent attitude of cheery optimism to the effect that while a session of hard times could no longer be denied, it wouldn't last long and things would somehow get better. That was the just-around-the-corner phase that irritated so many folks during the Hoover regime. Compare this with the hopeful publicity about a Fall boom which is beginning to trickle out of Washington.

IT IS BEYOND this department's province to suggest that this last-named attitude is unsound. Indeed, it is to be hoped that it is justified. But the comparison in the official conduct of the two Presidents under somewhat similar circumstances raises a fair question of whether President Roosevelt will be able to pass another miracle, or whether it will do any good if he does get his miracles placed upon the statute books.

It may be, of course, that faith —the impressive faith of "de Lawd's angels"—will move mountains. The wheel of business recovery may catch the New Deal on the upswing and save the reform program from revision. And then there is always Congress to blame, now that the Supreme Court has resigned from the role of chief obstructionist.

SOME LIGHT on the President's future course may be shed when he delivers his opening message to the regular session on January 3. Will he admit retreat or boldly defy the very suggestion? This writer has a hunch that he will do neither but that his speech will pay compliment to both the right and the left.

This riding of two or more horses is something that President Roosevelt does very well, even if it does not of itself solve any problems. In-

deed, just as we recall Teddy Roosevelt as the great rough rider, we may some day think of Franklin Roosevelt as the great Roman rider.

In the end, however, the President will have to accept the responsibility in the public mind for whatever happens. It is the heritage of leadership—to be praised for the fair weather and blamed for the rain. This may be unfair but nothing can be done about it. The President may try to shift the responsibility on Congress, or lay the blame on business, or even on a conspiracy of newspaper editors. But to the "de Lawd's angels" he will always be the leader. He cannot lay down this burden now. He'll either have to pass that miracle or else—.

Financial technicians assure us that the present business recession is not at all comparable with the economic catastrophe of 1929, either as to possible depth or possible duration. They have very plausible reasons for this, but the idea is beginning to spread that business will either get worse or better without help from Washington. And if it gets worse it is going to be pathetic to see the destruction of the child-like faith of the New Deal zealots who must have their counterpart by the millions throughout the rest of the country.

THE MOST reassuring angle of the situation is that not all of the administration is in the hands of "de Lawd's angels"—the class that stands dumbly by and waits for miracles. We are fortunate in having a realistic Federal Reserve Board, an increasingly realistic Treasury Department, and a growing number of hard-headed conservatives who are getting into the White House and obtaining the attention of the chief—something that never happened before. James Roosevelt ("Sonny Jim") is performing yeoman's services in this respect. It is he who has opened the White House antechamber to the right wingers.

Just the same, the President has not yet been convinced—so it is generally believed by Washington observers—that he is facing a serious problem requiring affirmative and positive help for business. He has reached the point of admitting a bad situation, but he still thinks in terms of just-around-the-corner. As long as that attitude persists, he will surrender very little if any of his precious reforms which the business man insists obstruct business recovery.

COMING CONVENTIONS

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 25, 26 and 27.

Texas Telephone Association, Adolphus Hotel, Dallas, March 23, 24 and 25.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, March 29 and 30.

Missouri Telephone Association, Hotel Muehlebach, Kansas City, April 4 and 5.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 12, 13 and 14.

Nebraska Telephone Association, Hotel Paxton, Omaha, April 19 and 20.

Kansas Telephone Association, Topeka Hotel, Topeka, April 27 and 28.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, May 3, 4 and 5.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

Pennsylvania State Telephone & Traffic Association, Yorktowne Hotel, York, June 2, 3 and 4.

New York State Telephone Association, Seneca Hotel, Rochester, June 7, 8 and 9.

For example, he seems to think that a negative policy ("breathing spells") ought to be sufficient to pacify the business men. When he bargains with the power utility men, he wants commitments without offering anything definite in return. He still refuses to modify the holding company "death sentence," or to do something about Federal competition with private electric companies. His concession of the "Seven TVA" bill was no concession at all. He never could have gotten that bill through as Senator Norris wrote it, and he knew it.

IT IS SO EARLY in the new year to talk about such gloomy topics, but the foregoing discussion brings to mind some very unfair gossip being reported in Washington to the effect that the President is "nursing" the foreign situation so as to distract public attention from the breakdown in his domestic program.

The mere suggestion that President Roosevelt would deliberately pull a war rabbit out of his hat, or unduly protract an international incident for such small political reasons, is not only wholly without foundation, but also an unwarranted reflection upon the patriotism of our President. However, war talk and war scares have such a direct bearing upon the interests of all American industry, including the telephone industry, that TELEPHONY'S readers might care for a new angle on the foreign situation from the current Washington viewpoint.

The truth of the matter is that the State Department is floundering and groping—trying to find out by indirect means just what the bulk of the American people want this country to do with respect to the foreign situation. To find out, a number of well-worn diplomatic devices were trotted out both before and after the S. S. Panay incident. The President's speech in Chicago was one sample, the "news leak" about the recent mobilization of the Navy at San Diego was another. The release of the exchange of communications between President Roosevelt and former Governor Landon on the subject of a solid American front on foreign affairs was a third.

By planting such a succession of feelers, the administration is trying to judge from the public's reaction how strong or how weak a position our State Department should take on Japanese aggression. The reaction, however, has been very mixed and, therefore, rather disappointing.

Strangely enough, it seems that the very radical groups, who were whooping it up for pacifism only a few years ago, are now writing into Washington demanding that the President take a much firmer stand than we have so far taken. Instead of campus "strikes" against war, they are organizing anti-silk boycotts and cotton stocking movements.

But the division of sentiment, according to fairly reliable information received by this writer, is more geographical than ideological. For example, New York City radicals are also joined by New York City commercial interests in demanding more protection of American property interests in China.

A contrary reaction comes from the interior, noticeably in the Middle West. In these places, simple farmers and humble mechanics, as well as professional and business men, have been moved to take pen in hand and advise the State Department that whereas Mr. Roosevelt and Mr. Landon can agree all they please on a "united front" in dealing with foreign affairs, they are absolutely silly if they think

that the writers of said letters are going to stand for another war in another country thousands of miles away over a quarrel that really doesn't concern us.

Letter after letter, and wire after wire, commenting sarcastically on "making the world safe for Chinamen" and others in the same tone are coming in from the hinterlands.

In other words, if the State Department's mail were reduced to terms of colored pin-heads, the "strong attitude" sentiment would run generally up and down on the Eastern and Western coasts—mainly in the large cities. The "peace-at-any price" sentiment would color up the bulk of the interior.

Although it would never publicly admit even a suggestion of it, the State Department secretly realizes that mobilizing public sentiment into a "united front" with respect to another foreign scrap would be much more of a task than it was in 1917, if indeed it could be done at all. We'll hear much more about this when Congress gets into the Ludlow amendment for compulsory national plebiscites on war declarations at the regular session.

THINGS HAVE been fairly quiet at the FCC, which is to be expected during the holiday season. Officials who didn't go out of town found ample opportunity for cordial visitation and celebration. One cause for celebration was the elevation of Lieutenant Ewell K. Jett to the post of chief engineer to succeed Commander T. A. M. Craven, now a member of the commission. Lieutenant Jett, a retired Naval officer and noted radio expert, had been serving as acting chief engineer.

Another cause for cordial visitation was to wish bon voyage to several FCC officials who are going with the State Department delegation to the big international radio conference opening at Cairo, Egypt, on February 1. The delegation will be headed by U. S. Senator Wallace H. White, of Maine, and the trip should keep the Senator out of the country for at least four months of the regular session.

But that won't prevent the anti-FCC bloc in Congress from plugging the Senator's radio investigation resolution while he is away. The widely-discussed Mae West broadcast is the latest bit of fuel added to the fires on this front. Incidentally, the American Telephone & Telegraph Co. will be represented at the Cairo conference by Dr. Frank B. Jewett, president of the Bell Telephone Laboratories.

The Operators' Corner

By MRS. MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

GOOD "information" service has a direct bearing upon satisfactory toll service. Series No. 313

THE IMPORTANCE of good "information" service can not be over-estimated. To be satisfactory it must be prompt, courteous and accurate.

To insure prompt information service, adequate facilities, properly arranged, are necessary. Slow answers to information calls may result from insufficient trunks, poor distribution of calls, failure to answer signals in order of appearance, incorrect or illegible records, or an insufficient number of copies of records. In large offices, assignment of force throughout the day and at certain times of day, experience and ability of the force, and character of supervision also have an important bearing upon the promptness of information service.

When a customer asks for or is referred to "Information," he should be treated courteously. The operator should listen attentively to the customer's request and, if unable to supply the desired information immediately and sufficient understood details are received to begin a search for the desired number, the information operator should acknowledge the call by saying, "One moment, please."

In requesting additional information from the customer, the information operator should say, for example, "What is the address, please?" or "What are the initials, please?"

Accuracy is a major part of rendering satisfactory information service. While it is intended that a certain amount of numbers should be committed to memory, an information operator should be absolutely certain she is supplying the correct number.

An information operator should keep in mind that if a customer receives a prompt answer from the local operator and then has to wait an unreasonable length of time to reach the information operator, the effect of the prompt local service is obscured by this delay.

While all information calls should receive prompt attention, this is especially true of long distance information calls because these calls involve the use of toll facilities and, in order to complete long distance calls while the customer is holding the line, the called number must be secured with the least possible delay.

In reaching an information operator at a distant point it is important that the calling operator announce her call properly, as, for example, "This is Long Distance. Granite City, J. G. Hill, 218 Main Street." By making this announcement the information operator at the distant point will know that a long distance operator is waiting on the circuit for the desired information concerning her call.

By giving the name of the called place, in offices where information calls are handled for more than one point, it will not be necessary for the information operator to ask which city or town is desired, thereby saving operator's time at both the originating and terminating point, conserving the use of the toll circuit and speeding up the customer's call.

Questions from Illinois Operators

1. Of what importance to good toll service is good information service?
2. Are Ashmore and Oakland tributaries or ringdown tributaries to Charleston since Charleston dials the numbers?
3. On a MX connection, when the via routing is given by the operator, should it be shown on the ticket?
4. If charges are refused on a station-to-station collect call and the call is not tried again in a reasonable length of time, does it take a report charge and is it canceled and a new call made?
5. If the called party is not reached on the first attempt on a person-to-person call and you leave word; later the called party reports ready and the calling party is out, what report do you enter on the ticket?

The answers to these traffic questions may be found on page 36.

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New Catalog
Listed in this new catalog you will find private branch exchange equipment of every type. Keep abreast of latest developments by writing for your copy—now!
PRIVATE BRANCH EXCHANGE EQUIPMENT
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PRIVATE BRANCH EXCHANGE EQUIPMENT TO *Fit Every Requirement!*

● Automatic Electric private branch exchange equipment includes both manual P.B.X. boards and automatic P-A-B-X units in a complete range of sizes and types to fit every telephone company requirement.

"Monotype" manual P.B.X. boards are available in both floor and cordless types and are built to the same high standards of quality and performance that characterize the larger Monotype switchboards.

P-A-B-X (Private Automatic Branch Exchange) units can be furnished for either attended or unattended operation, as desired. Besides rapid intercommunicating and trunk service, such special services as Code Call, Executive Priority, Conference Service, Emergency Alarm and Watchmen's Supervision can also be provided. Write for Catalog 4060—*today!*

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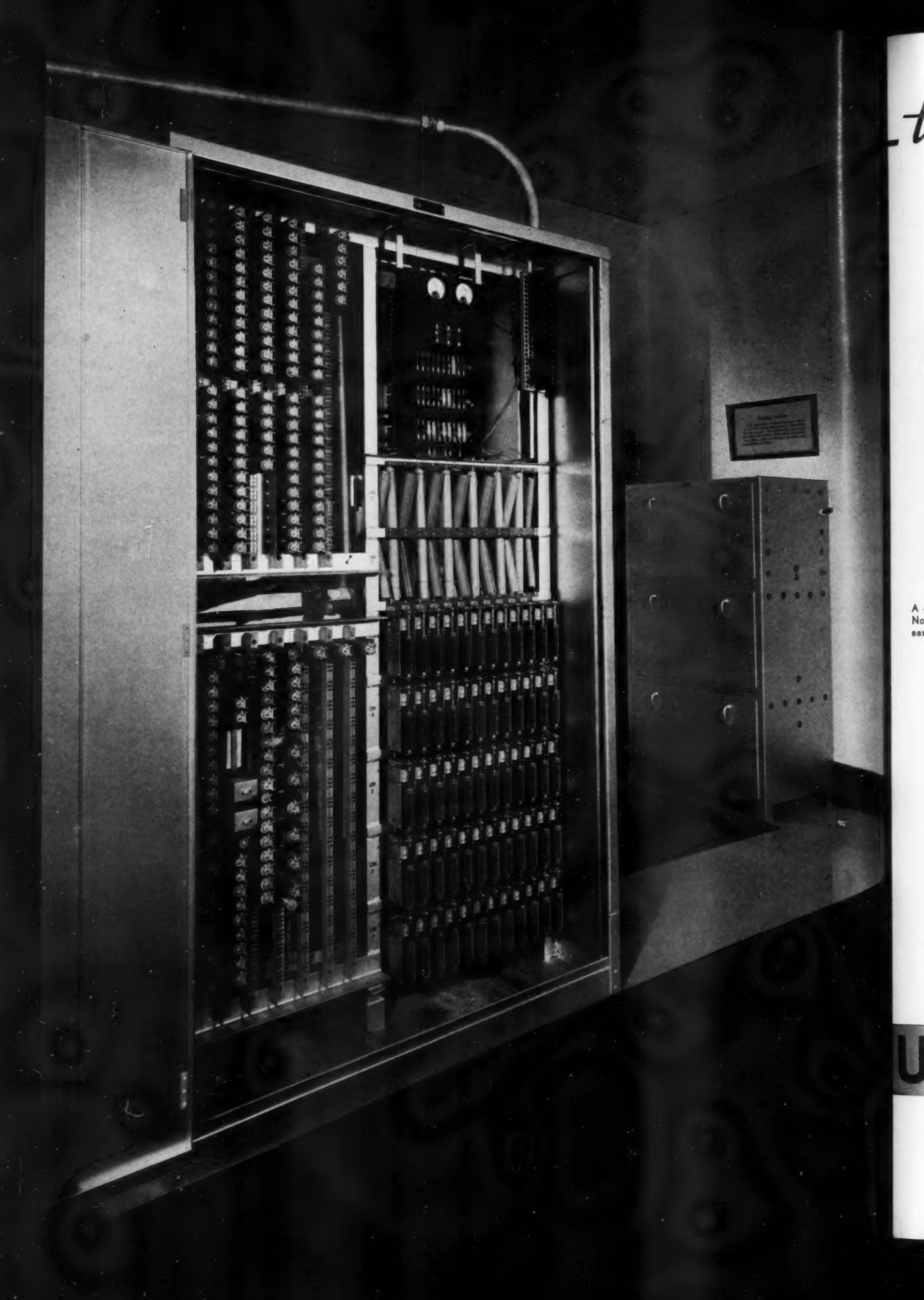
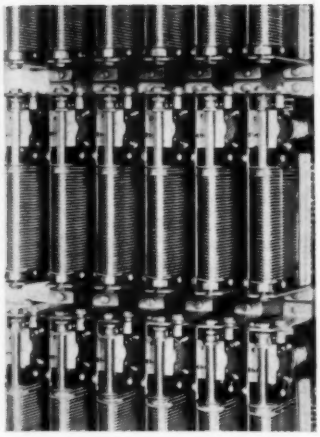


"...the smoothest-running board we've ever had in service!"



A group of Automatic Rotor Relays. Note their clean-cut simplicity and easy accessibility.

The Automatic Rotor Relay switchboard shown on the opposite page was recently cut in service by a well-known Independent telephone company. This board—the first of its type which they have installed—has already become the subject of enthusiastic comment among the telephone company's personnel. According to both official and unofficial reports, the board has operated with perfect smoothness, accuracy and speed from the instant it was switched into operation.

This, too, in spite of the fact that the number of daily calls since the cutover has averaged almost three times the former normal figure—convincing evidence of the switchboard's ability to handle full capacity traffic loads with no warning or advance notice.

The Automatic Rotor Relay as used in this switchboard is the finest and most economical mechanism ever developed for relay-type operation and all small exchange owners are urged to investigate in detail its unusual features of design and operation. Automatic switchboard units using the Rotor Relay are now available in any capacity from ten up to one thousand lines, and will work in connection with either magneto or central battery substation apparatus, grounded or metallic circuits. Write for full information—today!

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The Year 1937 in the Telephone Industry

(*Continued from page* 15)

rotor relay was the basis for a new series of the existing line of the relay type automatic equipment of this manufacturer. It has resulted in added simplicity of design and smoothness of operation in the field of this type of automatic switching. These new switchboards are designed for small exchanges and have ultimate capacities of 30, 60 and 100 lines.

In the methods of signaling subscribers, two new telephone signals have been developed by the same manufacturer—one is a pleasant-sounding chime and the other a desk lamp signal making use of a neon tube. Both of these signals operate directly from ringing current and require no intervening relay.

The tone of the chime is not loud but because of its resonance can be heard for a considerable distance, in a moderately quiet place. The visual call indicator flashes brilliantly at each ringing impulse. It is intended for use in noisy places where the ordinary signal cannot be heard or in very quiet places where an audible signal might be disturbing.

In addition to the main developments of the principal manufacturers, the various protection, tool and supply manufacturers added new devices and improvements to their products. The protective equipment developments tend toward compactness, greater efficiency of operation and economy in first cost and maintenance. The new tools likewise have been designed for lightening labor and saving time.

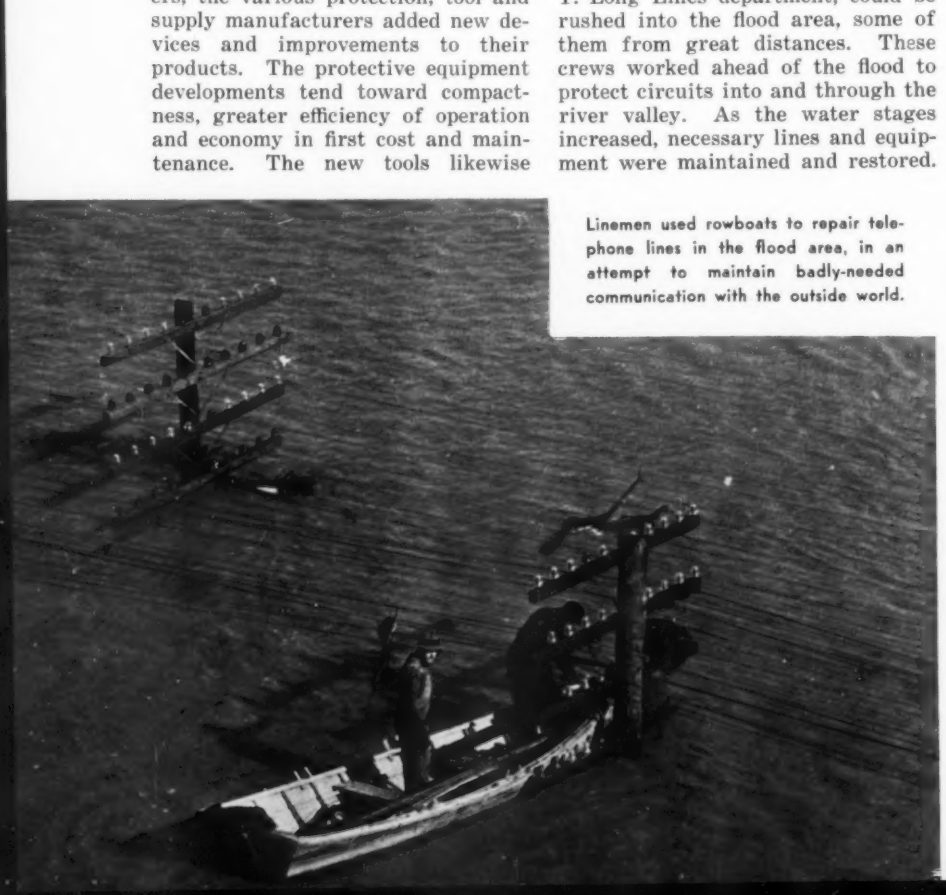
Sleet and Flood Damage Unusually Severe in 1937

Damage to telephone plant from sleet storms and floods was unusually severe during the past year. During January last heavy sleet storms affected a wide area, extending from southwestern Texas northeasterly across Oklahoma, Kansas, Arkansas and Missouri. Parts of Iowa, Illinois, Indiana, Tennessee and Kentucky were also affected.

In the territory of the Southwestern Bell Telephone Co. alone the first storm resulted in 25,000 poles down or broken, 2,500 toll circuits out of service and 60 towns isolated at one time or another. Subsequent sleet storms, although less widespread, did additional damage.

Following closely upon the sleet storms, flood stages occurred throughout the whole length of the Ohio and Mississippi Rivers from Pittsburgh to New Orleans. Heavy damage was done to telephone plants in the inundated cities along the Ohio River.

Fortunately, plant crews from the neighboring Associated Bell companies, as well as from the A. T. & T. Long Lines department, could be rushed into the flood area, some of them from great distances. These crews worked ahead of the flood to protect circuits into and through the river valley. As the water stages increased, necessary lines and equipment were maintained and restored.



Linemen used rowboats to repair telephone lines in the flood area, in an attempt to maintain badly-needed communication with the outside world.

Traffic over the long-haul circuits in the flood area increased tremendously. On Sunday, January 24, for example, the number of outward long distance calls from Cincinnati was 330 per cent above normal, from Louisville 184 per cent, and from Memphis 60 per cent above normal. A week later on January 31 outward long distance calls from Cincinnati were still 84 per cent above normal, from Louisville 135 per cent, and from Memphis 70 per cent.

Similar increases occurred in other cities, the effect of the flood crisis being reflected in marked traffic increases in such cities as Pittsburgh, Cleveland, Chicago and St. Louis. To meet these increases in traffic, trained operators volunteered and were sent from as distant points as New York, Philadelphia, Kansas City and Dallas to Cincinnati, Louisville, Memphis and 14 other similarly affected points.

In a little over two weeks, orders placed by Bell companies on the Western Electric distributing houses, and shipped, included 35 sections of No. 12 switchboard, 28,000 handsets, 23,000 subscriber sets, 38,000,000 conductor feet of rubber-covered wire, 216,000,000 conductor feet of cable and 325,000 pounds of pole-line hardware.

Various Independent companies suffered damage from the sleet storms and floods. In the Ohio Valley exchanges of several companies—such as Southern Indiana Telephone Co., Lawrenceville, Ind., and the Portsmouth Home Telephone Co., Portsmouth, Ohio—were abandoned when reached by the high waters.

As the flood waters receded, men commenced the work of restoring temporary service, working both inside the exchange and on the outside cable and wire plant. Telephone manufacturers and supply companies responded promptly to calls for equipment and materials.

Companies outside the afflicted area assisted with men and some emergency equipment. Local exchange service was gradually restored within a month or six weeks after the flood passed; permanent replacements, however, took several additional months.

Teletypewriter Exchange Stations Increase

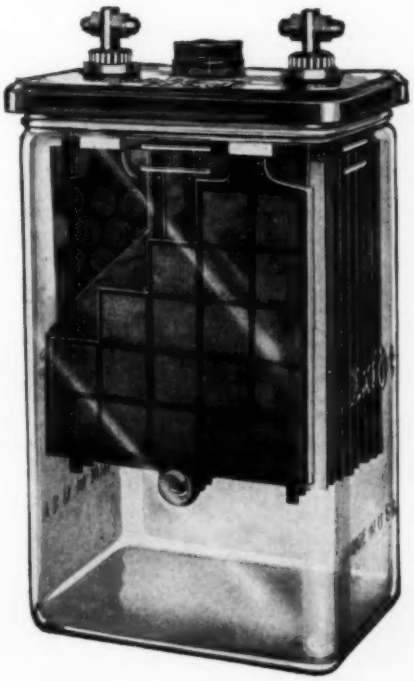
During 1937 approximately 1,800 stations were added to Bell System

Let Us Help You Keep Him Pleased

CUSTOMER satisfaction is more important in the telephone business than almost any other. Let Exide Telephone Batteries help you maintain it by assuring the quick, clear, accurate and unfailing operation of your exchange equipment at all times in any emergency.

When accidents or the weather disrupts the normally smooth routine of your exchange, Exide Telephone Batteries can be relied upon to deliver their full capacity of power *when you need it most.* The operation of these batteries is not interfered with by fluctuations or interruptions of the normal supply of a.c. power. Throughout any emergency they will help keep the majority of your lines in service.

No matter what storage battery job you have to be done—common battery, emergency reserve, signalling, or P.B.X.—it will be more dependably and economically done with an Exide Battery. Their initial cost is moderate, and their maintenance costs are low.



Exide-Chloride cell cut away to show its sturdy construction. Length of life and reliability far beyond average. This battery is especially adapted for all classes of telephone service.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

Exide

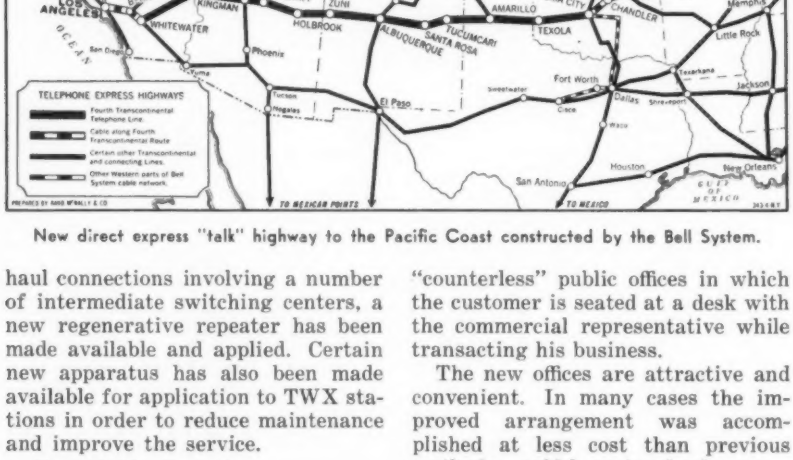
BATTERIES

FOR EVERY TELEPHONE USE

teletypewriter exchange service, making a new high of about 12,000 stations. To provide for the growth of business about 60,000 more miles of telegraph line circuits were placed in service, making a total of more than 700,000 miles for this class of service.

Additions were also made to the switchboards at practically all the centers, the multiple 1440-line No. 3A switchboard being installed in approximately 15 additional centers. The non-multiple 80-line No. 5 switchboard, which was made available during 1936, has also been installed in several centers.

To improve the service over long-haul connections involving a number of intermediate switching centers, a new regenerative repeater has been made available and applied. Certain new apparatus has also been made available for application to TWX stations in order to reduce maintenance and improve the service.



New direct express "talk" highway to the Pacific Coast constructed by the Bell System.

The Bell's Fourth Transcontinental Line

Construction work was in progress during the year on a new transcontinental route—the fourth main line. The new circuit links the cable network of the East and Middle West with that of the Pacific Coast. It passes through Oklahoma City, Amarillo, Texas, Albuquerque, N. M., and Whitewater, Calif.

In addition to the stringing of additional wires on existing pole lines, construction of a new pole line across the rugged desert between Amarillo, Texas, and Albuquerque, N. M., was required. The work was completed in middle December.

The use of the new broad-band system for open wire is contemplated for this circuit so that ultimately it will be possible to transmit 16 telephone conversations simultaneously over each pair of wires.

Bell System Business Office Requirements

Bell System business offices range from small offices with one or two attendants up to large offices of as many as 200 employes. There are more than 5,000 business offices in the Bell System with a total personnel of over 15,000. These offices handle by personnel visits, telephone calls, or correspondence nearly 42,000,000 transactions each year.

In recent years both the layout, equipment and operation of these business offices have been improved. Among other changes is the introduction and improvement of the so-called "counterless" public offices in which the customer is seated at a desk with the commercial representative while transacting his business.

The new offices are attractive and convenient. In many cases the improved arrangement was accomplished at less cost than previous methods would have involved.

In addition to other arrangements, consideration is given, in planning new public offices, to the provision of equipment displays by means of which services available may be demonstrated to customers. For those who wish to place a large number of calls "customer's rooms" are provided where the telephoning may be done with privacy and comfort.

Public Health Aspect of the Telephone

The extended use of the telephone and the fact that the user brings the instrument near the mouth has naturally resulted in frequent questions as to whether the telephone plays any appreciable part in the spread of communicable disease. Especially has this question been directed to the public telephone with its succession of different users.

Although careful investigations by the Bell System have indicated that the telephone transmitter is not to be considered a source of infection, it was decided in 1934 to have two independent investigations made by competent authorities who could bring to this matter the best bacteriological techniques and who would represent expert opinions in the fields of public health.

One investigation was made in Chicago under the direction of the late Dr. Jordan of the University of Chicago, and the other in New York, under the direction of Dr. Emerson of Columbia University. The report of the Columbia University work was published in the American Journal of Public Health for October, 1937. The report of the University of Chicago work has not yet been published.

In Chicago about 200 telephones were carefully examined in a search for the presence of bacteria, while in the New York investigation 246 telephones were visited and examined. In general, the results have indicated that the telephone is an unimportant factor in the spread of disease germs as compared with the many other common sources of infection.

In the investigation, harmless bacteria were found on many telephone mouthpieces and certain types of disease-causing bacteria on some. It was shown however, that nearly 90 per cent of most types of germs were dead within 15 minutes after they were deposited on the transmitter and that there was no tendency for living bacteria to accumulate on the transmitters.

Furthermore, such organisms must be transferred by actual contact with the instrument, and it has been shown by both investigations that there is relatively small chance of this. The telephone mouthpiece, therefore, is no greater sanitary hazard than is the hand-rail, the door knob and other articles in frequent contact with human hands.

As a result of these investigations it is clear that the telephone cannot be considered as an important factor in the spread of disease and that any routine disinfection of public telephones would not be a justificable public health requirement.

Wire Developed for Bell System Use

As an outgrowth of the development of underground distribution wire for rural line construction, a new type of bridle wire has been developed for underground use by Bell companies.

This new wire is of twisted-pair construction. It is insulated with rubber having physical characteris-

tics identical with that employed in an underground distribution wire. In addition, each wire is covered with braid as a protection against the effects of weather in the portions of the run located above ground.

During the year there was continued extension of the use of the rubber-covered twin telephone wire which is placed directly underground. Recently a new type of plow has been designed for installing this type of wire and small or medium-sized buried cables. The new plow can be arranged to carry a maximum of four reels of wire.

The maximum depth of trench which can be made with the new plow is 24 inches, and there are adjustments so that 20 inches or 16 inches can be obtained if desired. The plow has considerable stability in maintaining uniform depth even though the soil conditions are severe.

Cable Developments Made by Bell System

One difficulty which has always existed in maintaining the underground cable plant is to adequately protect against corrosion of the cable sheath, particularly under certain soil and moisture conditions. Such corrosion has caused deterioration of cables with consequent service troubles and financial loss.

Recently there has been developed by the Bell a method for the protection of cable sheath which has proved successful on a trial basis. This method involves the application at the factory of coatings of asphalt, paper and fabric materials.

Another development, which is the result of manufacturing refinements applied to exchange cable, without changing the properties of the cable, has been an increase in the number of gradations of sheath thickness for various diameters of cable.

Previously the thickness of sheath was changed in five-mill steps for the smaller cables and ten-mill steps for the larger. Under the new manufacturing practice, sheath thicknesses are changed in one-mill steps. This makes the sheath thickness more nearly proportional to the diameter of the cable with consequent reduction in the amount of lead required.

In splicing cable the practice for many years has been to boil out the moisture in the splice with hot paraffin. A new method recently developed and now being introduced in Bell companies on a trial basis makes use of a desiccant—a specially-prepared anhydrous calcium sulphate. This material dries out the splice by chemical combination with moisture.

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CANADIAN TELEPHONES & SUPPLIES, LIMITED, Toronto, Montreal, Winnipeg and Vancouver
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Or any other telephone supply house

It is not harmful to the sheath, conductors or insulation.

Subscribers' Key Equipment, Bell Companies

The needs of subscribers for increased communication facilities are taken care of to a large extent by the extension telephone, and, where more elaborate arrangements are required, by private branch exchange switchboards. There are many uses however, in between a simple extension and the P. B. X. where use of a type of subscriber facilities known as "wiring plans" has grown up.

The design of these wiring plans has recently been coordinated in the Bell System under the name of "key equipments." The larger key equipments frequently accommodate more trunks than the smaller P. B. X.'s and the distinction is chiefly one of function. In general, where these equipments are used, intercommunication between extensions, although sometimes provided, is generally more incidental and the ratio of central office trunks to local extensions is ordinarily higher.

A primary purpose of the key equipments is usually to allow any of a number of stations to answer or to originate calls on any of a numbers of trunks, but there is a considerable variety in the types of equipment provided which permit specific uses.

With the recently-developed "101 type" key equipments as many as 40 lines can be made to appear before one attendant and the lines may be multipled to as many as 12 attendants. In these systems the equipment includes a key box and a relay cabinet.

Among other uses the 101-type key equipment lends itself well to providing secretarial service where a secretary in an outer office may answer any of several lines. When used for this purpose, the bell at the subscriber's station will ring at the same time that the line lamp flashes at the key equipment.

The line may be answered at either place. The circuit is arranged so that in either case the line lamp will change from flashing to steady, which is a signal to the attendant that the call has been answered. If desired, the circuit can be made to cut off the attendant when the main station answers.

This New Year's Resolution Is Still Appropriate

"The curse of the present times is that humbug—FEAR. Act natural, step out, buy so somebody else can sell. Then they can buy and somebody else can sell. It's an endless chain that spells prosperity . . .

WORRY—there's another old humbug which never did anybody any good. If you lose one subscriber, don't sit down and worry; go out and get two new ones. They are to be found if you hunt hard enough; every selling campaign of the past year proves that. Worrying about yesterday won't change it; and worrying about tomorrow is useless. Forget yesterday and anticipate tomorrow.

Remember, you are in the telephone business, the best business in the world—an absolute necessity to all mankind, a prosperous business, an honest business and a happy business. Once more, let us resolve to meet the New Year with eager anticipation and a determination to so conduct ourselves and our business that we will set, before the world, such an example of optimistic confidence and belief in the future that will overcome all obstacles."—Harold E. Bradley, of Harrisburg, Pa., late president of the Pennsylvania State Telephone & Traffic Association.

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No aging or deterioration . . . unaffected by sudden temperature changes . . . interval strains and stresses removed . . . homogeneous in character, only one coefficient of expansion . . . sustained high dielectric strength . . . clear, flawless for easy inspection . . . all surfaces impervious to moisture . . . tougher, improved glass to withstand rough handling. Write us about your requirements. We'll gladly send samples.

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Bell Telephone Sets; Selective Ringing

The Bell System combined telephone set, which has been given extensive field trials, went into production early in the year. A considerable number of sets were placed in use during the year and a much larger number will be installed in 1938. Practically all of the elements of the combined telephone set are new as a result of extensive research and redesign.

In 1936 there was introduced in the Bell System plant an electron tube device for the purpose of improving selective ringing on party lines. While this new device is radically different in its operation from vacuum tubes employed in repeaters, it is an electron device and its design employs many features resulting from vacuum tube research carried on over a long period of years.

Its use has been found very advantageous. The ringer is held off the line except when ringing voltage is applied, and bell tapping and false ringing sometimes caused by dialing or switching operations on the line, are eliminated, to mention some of its advantages.

The number of these tube devices

employed is increasing to the extent that by the end of 1937 there were well over 250,000 installed in subscribers' station sets in the Bell System. This number compares with about 400,000 vacuum tubes employed otherwise—largely in the toll plant—in the Bell System.

Since there are approximately 1,000,000 subscribers' sets to which it is expected this new type of tube will apply, it is only a matter of a short time before the number of vacuum tube devices employed in the local Bell System exchange plant will exceed those in the toll plant.

Bell Telephone Cord Development

One of the difficulties in making available rubber-insulated telephone cords for subscribers' station sets has been that of making satisfactory soldered connections. One of the principal causes of this difficulty has been the presence of corrosion on the tinsel conductors caused by the sulphur that is used as the vulcanizing agent in the rubber compound. This sulphur corrosion has made it even more difficult to obtain suitable electrical connections by the use of the desirable solderless cord tips.

The process of vulcanizing rubber by heating a mixture of rubber and sulphur has been employed for about a century and until very recently this has been the essential method involved. More recently, it has been found by research methods that materials other than sulphur can bring about the condition called "vulcanization" in rubber.

Development work along these lines in the Bell Telephone Laboratories has recently resulted in a rubber compound that, with proper manufacturing processes, has proved satisfactory for use with tinsel cords and permits the use of solderless cord tips.

With the new insulation, corrosion is reduced to a negligible amount.

Fair Dealing Between Employe and Employer

"The wages of labor have been the problem of ages . . . The wages of labor should be a fair division of what is earned, to provide a comfortable home and a fair share for pleasures. The supreme thing needed is confidence between labor and the employer, and fair dealings between them."—The late W. G. Brorein, founder and president of the Peninsular Telephone Co., Tampa, Fla. and president of the Florida Telephone Association.

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Those companies who believe in using dependable, highest quality materials as a means of saving money and insuring their subscribers continuous service have been choosing Rainier Wood Products for many years.

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Chicago

Furthermore its mechanical and aging characteristics are distinctly superior to those of the insulation formerly used. Further development has resulted in incorporating colors into the white rubber compound so that it is no longer necessary to employ textile braids for conductor identification purposes.

These improvements have made it possible for Bell System companies to employ rubber-insulated cords in place of the textile-insulated cords used previously.

Sleeve-Pressing Tool for Wire Splices

Illustrative of new tools developed and standardized for plant work in the Bell System is a sleeve-pressing tool for splicing drop, bridle, duct and inside wire as well as underground distribution wire. Joints are made in insulated wires with this new tool by placing a sleeve over the ends of the conductors and pressing it firmly against them with the tool.

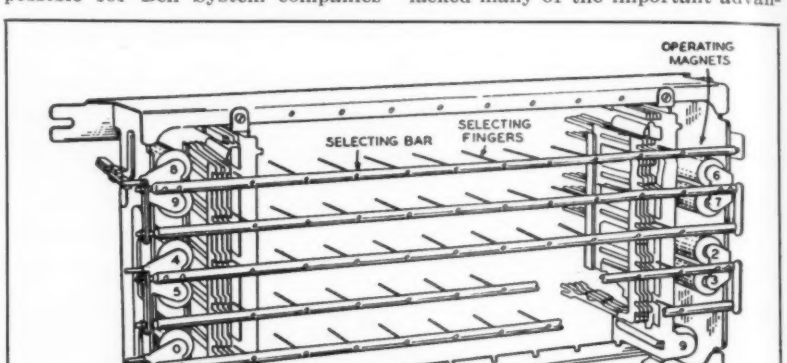
These joints are stronger than those previously made with twisted sleeves and they are also air-tight, which prevents corrosion and increase of resistance. The tool is a hand-operated, hardened steel plier arrangement with a toggle-and-lever mechanism.

Local Switching Systems for Bell Exchanges

Progress was made during 1937 toward further trial installations of the new automatic central office switching system employing the crossbar switch, which was announced in 1935 by the Bell System.

A trial installation of over 3,000 equipped lines is well along toward completion in a residential district and a further trial installation has been started on a full unit of 10,000 lines in a district with high calling rate and heavy P.B.X. development.

The fundamental unit employed in this system—the crossbar switch—is old in principle. Much work has been done by the Bell System on the development of the crossbar switch structure. This work began as early as 1913, and several patents were subsequently granted on these devices. The early switch, however, lacked many of the important advantages which make the present design desirable.



Partial perspective of the crossbar switch.

In the switch itself there are five horizontal selecting bars capable of operation in either direction and operating on ten rows of contacts. There are 20 holding bars and thus 20 vertical rows of contacts although other numbers of holding bars may be used.

The contacts themselves are similar to those on an ordinary relay and in practice twin contacts of precious metal are provided, thus giving greatly increased assurance that a good connection will be made. This avoids the sliding contacts of other large dial systems with prospects of increased speed and of other advantages.

Community Dial Offices in Bell System

Progress was made during the year in the installation of unattended dial equipment in offices serving small communities and the interconnection of these equipments with the general Bell System network. During the year about 150 offices, totaling over 25,000 lines were installed by Bell companies.

The Bell System has investigated this type of office over a long period of years, including the installation and trial of 30 offices. The adaptation of this unattended equipment to function properly with other offices,

including toll, has involved many circuit, equipment and operating problems. Sufficient progress has been made with these to indicate the use, at an increasing rate, of this type of office.

Supplying Power for Central Offices

A new power plant capable of either automatic or partially automatic operation has recently been developed for dial and toll offices of Bell companies requiring from 200 to 2,000 amperes at 24 and 48 volts.

In addition to its automatic features, this new power plant differs from those previously commonly employed in the use of a single battery for each of the two voltages instead of the employment of duplicate batteries in which the 24-volt tap was taken off at the proper point.

In the new arrangement, in addition to emergency cells, counter e. m. f. cells are provided so that the batteries may be charged while connected to the load.

This new plant equipment involves the use of a number of generators which not only may be automatically regulated to maintain the voltage at the correct value but which may be automatically started or stopped and cut in or out from time to time to meet the major variations in load during the day. With this arrangement a regulated generator is operated throughout the entire 24 hours.

Storage batteries are still very important, of course, in the event of power failure. During normal operation, the battery acts as a filter to reduce the noise that is caused by the generator.

The manually-controlled features, which may be substituted for automatic features, are desirable where the greater cost of full automatic operation is not justified.

Rectifier for Telephone Power Supply

During the year a rectifier for use in small central offices of the Bell System was developed. It automatically maintains the charge of the battery, regulates its voltage and recharges it when necessary. This device depends on the use of the grid controlled rectifier tubes, a recent development which has greatly extended the application of rectifier tubes to power problems.

The output current of the tubes is controlled by changing the relative phase relations of the voltages applied to their grids and plates. Automatic control is obtained by applying the battery voltage to auxiliary tubes.

This regulating circuit will maintain the battery voltage constant within $\pm$ ¼ per cent for line voltage changes of $\pm$ 10 per cent, for load changes from no load to full capacity, and for room temperature changes from 10 degrees to 40 degrees Centigrade.

Bell System in Inductive Coordination Work

Several of the more outstanding problems of the year 1936 received attention during 1937. Reports were completed by the Joint Subcommittee on Development and Research, Edison Electric Institute and Bell System, on noise-frequency inductive coordination of rural power and telephone systems, and on the safety features of the joint occupancy of poles by telephone circuits and higher voltage power distribution circuits.

New specifications for the joint use of poles were prepared and issued for trial by the Edison Electric Institute and the Bell System.

Questions of considerable importance have arisen involving inductive coordination at noise frequencies in connection with large installations of rectifiers at industrial plants. Development work has been completed on new instruments for use in inductive coordination work.

The extension of the electrification of the Pennsylvania Railroad from Paoli to Harrisburg, Pa., together with certain branch lines, is involved in exposures with a number of communication lines. The problems encountered are being handled, as in the past, through cooperative studies conducted by the railroad and the communication companies.

The reports of the Joint General Committee of the Association of American Railroads and the Edison Electric Institute, on the inductive coordination of electrical supply and communication systems, have been printed and distributed.

Ultra-Short Wave for Palomar Observatory

Illustrating the possibilities of ultra-short wave radio for point-to-point communication is an installation for operation in the frequency band of 30 to 42 megacycles connecting the top of Palomar Mountain, Southern California—site of the observatory to house the great new 200-inch telescope—with the California Institute of Technology, about 90 miles away.

Although the Pacific Telephone & Telegraph Co. provides telephone service to the top of Palomar Mountain by means of wire circuits, this installation was undertaken by the Bell System on a cooperative basis

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with the Institute in order to obtain data on ultra-short wave, point-to-point transmission under unusual conditions.

The circuit has operated successfully but there has been considerable interference with reception at the Institute largely from the ignition systems of automobiles in nearby streets.

Without this interference five-watt transmitters would apparently have been satisfactory but, to override the ignition noise and to increase the operating margin on the circuit in general, 40-watt amplifiers have recently been added. The transmitters are equipped with quartz-crystal oscillators which maintain the frequency within 0.025 per cent for a wide temperature range.

Arrangements were provided to connect several telephone stations to the radio circuit, and code-ringing features were included to enable a person at any telephone to ring any of the other telephones, local or distant. The transmitting sets at either end are energized by means of a key located at each telephone set.

This project has provided valuable data in the investigation of directional antennas and other features of the circuit.

Broad-Band Carrier Systems, Cable and Open Wire

For several years past the Bell System has carried on development work looking toward the commercial application of the carrier method to toll cables and also to the application of carrier systems employing a wider band of frequencies than at present being used on open wire.

The earliest standard system employed frequencies up to 30,000 cycles on open wires and provided three telephone circuits in addition to the regular voice circuit on a single pair of open wires. This system, together with one-channel systems adaptable to very short circuits, has been extensively applied in the Bell System plant.

Development activities to take advantage of increased frequency ranges have resulted in a new experimental type of transmitting structure—the coaxial circuit—and, in addition, two new carrier systems: one applicable to pairs in existing toll cables, the other to open-wire pairs. All of these are generally referred to as "broad-band systems."

When applied to two existing toll cables, the cable carrier system will give 12 telephone channels for each pair of circuits (one from each cable). Due to the use of frequencies up to 60,000 cycles, only about one-third of the pairs in each cable can be so developed, the remaining pairs being operated at ordinary voice frequencies.

An installation of this system between Toledo, Ohio, and South Bend, Ind., now under trial, is expected to be placed in regular commercial service in the spring of 1938 by the A. T. & T. Co. Terminals have been provided for two 12-channel two-way systems and repeaters have been provided for five systems, thus furnishing long circuits for testing on a loop basis.

Terminating amplifiers and channel equipment are installed at Toledo and South Bend, and repeaters are located at eight intermediate points. In addition to the trial equipment, sufficient apparatus will be installed to complete three systems for commercial service.

The system under development for open-wire lines will provide 12 telephone circuits in addition to the three circuits of existing type C system and the voice circuit. This makes a total of 16 circuits in all on a single pair of open-wire conductors. The upper edge of the frequency band employed is about 140,000 cycles.

Many problems have required solution in thus enlarging the capacity of open-wire lines. While the large gauge and wide spacing of conductors are favorable to transmission, it is difficult in this exposed type of structure to keep down induction from paralleling telephone circuits and interference from power lines, lightning or other of electrical disturbance.

An interesting and important fact about broad-band systems is that all

Competition Still Confronts the Telephone Industry

"Telephone managers should recognize that conditions in the field have changed and should adjust themselves accordingly. Competition is keen for the customer's dollar. If the telephone people are to get their share, it is absolutely necessary to get out after the business, as the time has passed when the business will come without solicitation, except in a limited way.

Since a telephone company has an exclusive franchise to furnish service in a given territory, it must assume the responsibility of seeing that the service is a credit to the industry and that public relations are maintained on a comparable basis."—The late Millard M. Borman, owner of the Abercrombie (N. D.) Telephone Co. and president of the North Dakota Telephone Association.

Train Your Employes To Understand Entire Field

"Train your employes to understand the telephone business in its entirety, instead of confining themselves to a narrow field. . . . Build up the best local organization that is possible.

"There is no greater stimulus to the growth and prosperity of a municipality or an agricultural community, than first-class telephone service. Where companies have established a quality of telephone service that the public is glad to employ at every opportunity, every business man and every resident of that community profits beyond any possible reckoning."—Frank A. Knapp, Bellevue, Ohio, late president of the Northern Ohio Telephone Co.

are being applied to non-loaded conductors. This means that they are high-speed systems whose wave velocity is 100,000 miles per second and over. As a result of this, there is no fear of difficulties due to echoes and noticeable delay in long-haul transmission. These had been anticipated if, for example, the old type four-wire loaded cable circuits, which have a velocity of less than one-fifth of that for broad-band systems, were the only resource.

A common part of all the broad-band systems is a group of modulating and filtering equipment that provides 12 voice channels over the frequency range from 60,000 to 108,000 cycles. In each system additional modulation places this band in the proper frequency range.

In addition to the foregoing broad-band developments there have also been made available during the past year improved single channel systems which are now being extensively applied in the Bell System.

Experimental Tests of Coaxial Cable System

A service trial of the coaxial-cable system between New York and Philadelphia installed in 1936 was initiated early last year by routing over it 27 toll message telephone circuits. Of these, 16 terminated in Philadelphia and 11 were to other points farther south. Aside from some troubles which were later corrected and which were associated with the automatic devices for regulating transmission, the operation was generally satisfactory.

During the period of tests, coaxial channels were employed for commercial voice-frequency telegraph circuits and for the experimental transmission of telephotographs. In general, the troubles experienced were not in excess of what would normally be expected in a radically new system. Nothing appeared during the trial in commercial service of these circuits which will interfere with the ultimate development of a satisfactory system for commercial service.

The coaxial system as employed in these tests transmitted a band width of approximately 1,000,000 cycles which is capable of transmitting 240 simultaneous two-way telephone conversations. The cable itself contains two coaxial units, one for each direction of transmission, enclosed in a lead sheath seven-eighths of an inch in outside diameter.

Later in the year further tests were made to determine whether the coaxial system could transmit satisfactorily a signal message the frequency components of which occupied its entire range; that is, a current of the kind required in television programs.

To study that possibility there were constructed by the Bell Telephone Laboratories a transmitter to originate a signal of that wide range of frequencies and a suitable receiver, both of which utilized some of the present techniques of television. For a source of a signal which could be repeated, over and over, a motion picture was used. Experimental showings were made in Philadelphia in November of motion pictures transmitted over the coaxial cable from New York City.

The demonstration was not designed to show improved television terminal equipment as, in fact, the most modern television equipment requires a frequency band of more than double the width available with the coaxial cable repeaters employed in this test. The trial, which was very successful, did show, however, for the first time the unique and economical utilization for television of the frequency band of a long coaxial cable.

The present 1,000,000-cycle repeaters on a portion of the cable are to be replaced shortly by experimental 2,000,000-cycle repeaters as the next step in the development of equipment to determine further the commercial possibilities of the cable. A 2,000,000-cycle system will provide about 480 two-way telephone channels or accommodate television currents corresponding to images of much finer grain than those transmitted during the November demonstration.

Magnetic Recording and Reproducing

Advances in the communication art frequently make possible utilization of earlier inventions which had hith-

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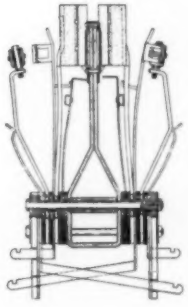
Central Office Protector

The Cook No. 3800 Central Office Protector is our latest design. It includes the ratchet type self-soldering coil, alarm circuit and cut-over and test springs. This protector operates to open the circuit and ground the line.

It is built in 51 and 101 pair sections. The pairs being spaced on 3/8" centers, give great economy in head-room.



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erto fallen short of success. An example of this is the system for magnetic recording and reproducing of speech which has been successfully demonstrated by the Bell Telephone Laboratories during the past year.

The system employed is similar to that invented about 30 years ago by Poulsen in which a steel wire was drawn rapidly past the iron cores of a set of coils and speech current in the coils caused a magnetic pattern to be left in the wire. When the wire thus treated magnetically was drawn past a set of reproducing poles, the process was reversed and the recorded speech was reproduced.

The difficulties with the earlier method arose from the use of round wire, from the establishment in the wire of magnetic elements which had large components along their length and from the lack of satisfactory magnetic materials. In addition, the powerful distortionless high-fidelity telephone amplifiers necessary were not then in existence.

It has been made possible now to overcome the difficulties of the earlier system by the development of suitable amplifiers and, particularly, improved magnetic material.

The use of this improved material in the form of a very thin and narrow tape instead of a round wire, together with suitably-designed pole pieces and other elements of the apparatus and circuits, permits the use of perpendicular magnetization which in turn eliminates the distortion inherent in the longitudinal method of magnetization.

As the result of these developments, a very satisfactory system of magnetic recording and reproducing has been produced. The record is available at once after the recording and can be erased immediately without destruction of the medium on which it is recorded. There is no appreciable deterioration with repeated use.

In addition to the research work and developments of the Bell Telephone Laboratories, Inc., already referred to, work has been carried on relative to methods for quickly evaluating effects of a new material for use in the preservation of wood, use of lead-calcium in storage battery plates, microchemical analysis, a development for measuring plating of the common machine screw and other threaded parts, studies in the dynamics of relays, and various other research.

Expansion and Extension of Overseas Service

The tenth anniversary of the commercial opening of the first overseas telephone service last January, saw a network of radiotelephone circuits interconnecting nearly all the land-wire telephone circuits of the world. Of the total of 38,000,000 telephones in the world, 93 per cent can be connected with any Bell System telephone.

Intercontinental telephone communication is now commonplace. Last week the longest Christmas greeting traveled more than eleven thousand miles—from Johannesburg, South Africa, to Chicago. The longest call in duration on Christmas Day was a 31-minute greeting between Paris and New York. There was a total of 755 Yuletide overseas calls.

In 1937, additions to the radiotelephone network of the Bell System included ship-to-shore transoceanic service extension in February to transpacific vessels, to the Bahamas, Bermuda, Central America, Dominican Republic, Europe, Puerto Rico and South America.

The transatlantic vessels, S.S. Washington and S.S. Manhattan, were provided with connection to the network on December 15 and 16. In Europe, connection with the ships is operated by the British Post Office with switching to the Continent and elsewhere, through London.

Caribbean service from Miami, Fla., was opened to Port au Prince, Haiti, September 29. Caribbean service was extended July 15 from Jamaica by way of Miami to Europe, Bermuda, Hawaii, Philippines, Netherlands Indies and to ships.

Transatlantic service was extended via London to Damascus, Syria, February 15; Sofia, Bulgaria, July 1; Bagdad, Iraq, via Cairo December 15.

In the transpacific radiotelephone service, new service was opened with Shanghai, China, and was temporarily discontinued August 13. On July 8, Juneau, Alaska, was connected from Seattle, Wash., by means of the War Department's radiotelephone channel. On October 20, Canton, China, was connected. On February 17, additional cities in Sumatra were connected via Bandoeng, Java.

In addition to these cities and countries connected with Bell System telephones and also included in the world radiotelephone network, were extensions from London to Braganca and Amparo in southern Brazil.

(EDITOR'S NOTE: *A review of telephone progress in foreign countries, a resume of some work of the Bell Telephone Laboratories, Inc., and a summary of rate cases in the various states will be published in next week's issue.*)

Obituaries of Telephone Men

SAMUEL H. MOUNCE, manager of the Carbon Telephone Co., Lansford, Pa., with which he had been identified for nearly 30 years, and a director of the Pennsylvania State Telephone & Traffic Association, died December 18 at his home in Lansford at the age of 64, passing away in his sleep. Mr. Mounce had been under the care of a physician for several months but it was believed that he had recovered and was enjoying good health.

"He was one of those rare characters who leaves an impression on a community," says the obituary concerning Mr. Mounce in The Evening Record of Lansford. "Likewise, he was a business executive who enjoyed not only the respect of a loyal force of workers, but his public contacts were such that in the public utility field he was looked upon as a man who gave good service and adjusted complaints with a kindness that made not only himself but the Carbon Telephone Co. stand out as an institution that was befitting a progressive community such as Lansford."

A native of New Jersey, Mullica Hill marking his birth, November 9, 1873, Samuel Mounce secured his early education in the local public schools. In his adolescent years he undertook to learn the machinist trade in Philadelphia, Pa., but later identified himself with the electrical industry, at Pittman, N. J.

After a brief experience with the Bell Telephone Co. of Pennsylvania at Pottstown and Doylestown, Mr. Mounce assumed charge of the Independent telephone plant at Mahanoy City. In 1909 he moved to Lansford as manager, lineman and repairman for the Summit Hill & Lansford Telephone Co., which later changed its name to the Carbon Telephone Co.

More than 1,700 telephones are now operated by the Lansford plant, which was built up under the wise guidance and direction of Manager Mounce. "The Lansford plant has long been regarded as an example of practical engineering," writes Executive Secretary H. M. Stewart, of the Pennsylvania association, in commenting upon Mr. Mounce's career in the telephone field. "It is frequently referred to among other telephone people as one of the most complete jobs in the state, without being overbuilt or unnecessarily elaborate."

Although a quiet, modest and unassuming man, Mr. Mounce participated actively and enthusiastically in every worthy community activity. It is said of him that he never sought an object for selfish purposes. During the World War his public work was outstanding.

Religiously, Mr. Mounce was a member of Trinity Episcopal Church. He is survived by his widow, one son, Francis, of Swedesboro, N. J.; two grandchildren, and one brother, John, of Philadelphia.

▼

EDWARD J. PRATT, electrical engineer, inventor and a member of the technical staff of Bell Telephone Laboratories, died December 20 in the Lutheran Hospital of Manhattan, New York City, after a short illness. Mr. Pratt lived at 353 Riverside Drive. His age was 50.

While working for the Bell Telephone Laboratories or for its predecessor, the engineering department of the Western Electric Co., Mr. Pratt perfected inventions of new types of retardation coils, relays, telephone call metering mechanisms and acoustical aids for the hard of hearing.

He had been concerned since 1921 with the design and development of electromagnetic apparatus. In 1927 he spent the year with the transmission network group of the Bell Laboratories on special studies of modulation in filters.

Born in South Dakota, Mr. Pratt was graduated in 1911 from Ohio State University as an electrical engineer. He immediately joined the Western Electric Co. at Chicago. In 1913 he was transferred to its engineering department in New York.

Surviving are his widow, Mrs. Mollie Scott Pratt, and a sister, Mrs. Walter Wood of Alton, Ill.

▼

WILEY H. CRITZ, district sales representative of the Southern Bell Telephone & Telegraph Co., at Lexington, Ky., died in early December in that city, after suffering a heart attack. Mr. Critz, who was 51 years of age, had been with the Southern Bell 30 years, serving successively as manager at Greenwood, Greenville, and Clarksdale.

Mr. Critz was a Rotarian and a member of the Methodist Church. He was born in Starkville, Ky. He is survived by his wife and two daughters.

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Some Personal Items

CHARLES C. DEERING, of Des Moines, Iowa, secretary-treasurer of the Iowa Independent Telephone Association and of the United States Independent Telephone Association, has the sympathy of his many friends in the telephone field in the death of his brother, Judson W. Deering, who passed away December 25 in Des Moines, at the age of 60.

Mr. Deering had been a civil engineer for the Des Moines City Railway Co. for many years, retiring last June. He was a bachelor and had made his home with his brother, Charles, for a number of years.

▼

ROBERT DEVORE, cable splicer for the Lincoln (Neb.) Telephone & Telegraph Co., recently won first prize of $50 in a contest sponsored by the National Safety Council. The contest was in connection with the safety calendars given by the Lincoln company to employes supporting families and residing at home.

On the back of the October calendar sheet was printed a picture in which were included a number of violations of safety rules. Contestants were asked to list and number such violations and then to write a statement, 200 words or less, on how to prevent homes fires. The $50 check received by Mr. Devore is significant of the fact that he complied with the contest rules in a splendid manner.

This is the second award within the ranks of the Lincoln company, sixth place in one of the safety contests having been won a few months ago by Robert L. Anderson, also of Lincoln.

▼

W. J. MELCHERS, vice-president and general manager of the Union Telephone Co. at Owosso, Mich., and a member of Wolverine Chapter, Telephone Pioneers of America, has been elected president of the Owosso Chamber of Commerce.

Mr. Melchers has long been prominent in the activities of the organization. For the past two years he has served as chairman of the agricultural committee, has been a director for two terms, and has been a member of the important industrial committee for several years.

▼

ALFRED L. GEIGER, of Washington, D. C., general attorney of the United States Independent Telephone Association, has been elected first vice-president of the Federal Communications Bar Association.

The organization's annual meeting was held in Washington December 14. Its membership is composed of lawyers having an interest in the various forms of communications. A larger percentage of its members are eligible to practice before the FCC than those of any other Federal bar association, it was stated.

▼

EUGENE SCHNEIDER, oldest employe of the Ohio Bell Telephone Co. in point of service, has retired after having been with the company for 47 years. His service dates back to the days when the telephone was looked upon as a luxury rather than a necessity, starting with the company at Lancaster in 1890. About a year later he was transferred to Columbus, where he remained until his recent retirement.

In his early service Mr. Schneider made most of the installations for the Columbus exchange. He installed the first newspaper switchboard in Columbus, and repaired many miles of broken wire after sleetstorms or high wind.

His fellow employes recently gave a testimonial dinner in his honor, presenting him with a gold watch as a token of their esteem. Mr. Schneider will make his home in Gambier, Ohio.

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IV. Transpositions.
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VII. Power System Wave Shape.
VIII. Transformer Exciting Current and Bank Connections.
IX. Flow of Residual Currents.
X. Control of Residuals.
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Commission and Court Activities

Must Share Cost of Metallicizing Lines

The sum of $610.50 must be paid by the Nobles Cooperative Electric to the Lismore Cooperative Telephone Co., Lismore, Minn., as the reasonable value of the materials necessary to metallicize grounded telephone lines and eliminate inductive interference which will be caused by the construction of electric lines, ruled the Minnesota Railroad & Warehouse Commission on December 21.

The order further directed that the Nobles Cooperative Electric make such payment to the telephone company before energizing the electric power lines involved. The order specified that the telephone company shall install at its own expense the materials necessary to metallicize its lines and eliminate the inductive interference which will be caused by the power lines.

The Lismore company, operating an exchange and rural telephone lines at Lismore, Nobles County, for more than 30 years, filed a complaint with the commission against the Nobles Cooperative Electric after the latter refused to compensate the telephone company for the materials required to metallicize its telephones line in order to eliminate the inductive interference whch would be caused by the Nobles Cooperative's paralleling power lines.

This particular rural power construction, known as Project No. 66, is being financed by the federal Rural Electrification Administration, and the power company had already begun setting poles and building electric power lines paralleling the telephone lines in question when the case was taken before the commission.

The Lismore telephone company has 92 rural subscribers along the telephone lines whose service would be detrimentally affected by the inductive interference caused by the paralleling power line. The commission's order stated that these telephone lines "have been in operation and in use for many years, and are prior occupants of the highways, . . . and have given the people in the community in which they operate economical and adequate telephone service."

Continuing, the order stated: "The best method known to science to minimize or eliminate such interference and render such lines serviceable is to metallicize the paralleled telephone lines for the full distance of the parallel and for a further distance of 500 feet beyond each end of said parallel, and install a repeating coil properly protected and grounded at each end of said parallel, and at any branches leaving said parallel.

"That 67.9 miles of complainant's lines will be affected by inductive interference, caused by respondent's power lines and that it will be necessary to metallicize 40.6 miles of said line, in order to make the same serviceable and capable of rendering commercial telephone service. . . . The difference between the total miles affected and those requiring metallicizing, or 27.3, may be made free from inductive interference by the use of repeating coils."

The commission's order ruled that the reasonable value of the glass insulators, oak brackets, wire and repeating coils, protectors and coil housings, which material is necessary to metallicize the complainant's telephone lines and eliminate the inductive interference which will be caused by respondent's power lines to the telephone lines, is $610.50. The cost of labor to install these materials will amount to approximately the same, the order stated.

▼ ▼

Wisconsin Rate Cases Up for Final Argument

Final arguments in the appeal of the Wisconsin Telephone Co. from disputed rate reduction orders of the Wisconsin Railroad Commission were commenced, December 27, before Circuit Judge August C. Hoppman in Madison. Preparatory to the opening of the final hearing in this long-drawn-out proceeding Judge Hoppman, for the past month, has been studying records of court testimony and figures compiled by the commission in the course of its five-year investigation of the rates and practices of the Wisconsin company.

Before giving attorneys for the telephone company and the commission opportunity to make their final arguments, Judge Hoppman declared that he wanted more "concrete" facts and less generalities and discussions of the law. "I've had more trouble getting the facts cleared away in this case," said he, "than in all the cases I've worked on in 22 years on the bench."

Among things not clear, the judge pointed out, was the matter of "going

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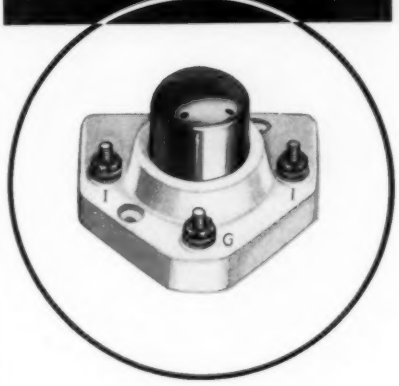

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value." The commission, he said, had given little consideration to testimony on going value, although it had claimed it had. Since in similar orders the United States Supreme Court had held no separate figure had to be given for going value of a company in estimating rates, Judge Hoppman said he was bound to allow also that it need not be separated.

Nor had the commission given consideration to company testimony on depreciation, the judge said, picking out another point on which he desired figures.

The first argument was presented by Frederic Sammond, Milwaukee, attorney for the Wisconsin Telephone Co. "Commissioners come and go, in and out of town and in and out of office," he declared. "Yet we are told the commissioners' finding of fact have the presumption of evidence." The assumption challenged, he said, was indicated in earlier arguments made by commission counsel.

H. M. Wilkie, special counsel for the commission, challenged the $4,000,000 surplus claimed by the company and charged that the company had an additional $16,000,000 surplus. The telephone company had prospered in Wisconsin under regulation, he declared, and had come through the worst depression in history with an admitted $4,000,000 surplus. Regulation had come because of utility abuses, he stated, and the instant telephone case was "a test case to see if regulation can deal with a large utility."

"The Wisconsin Telephone Co. is not quarreling with regulation," replied Attorney Sammond. The company's rate base claims, he said, answering Mr. Wilkie's charges, "are identical with what the property cost the company."

Rates charged by the company, Mr. Sammond continued as argument was resumed December 28, "should be high enough to allow the company to build up a fair surplus."

One reason the company's depreciation figures did not tally, the company's counsel said, was because, in one computation of depreciation, reserve funds set aside for emergencies were included. This depreciation reserve was large, he explained, because the company had to have money available at all times to repair damage caused by unpredictable storms. One storm in 1922 had cost the company $1,000,000, he declared.

Attorney Sammond claimed superiority of company's physical inspection of property to determine depreciation over the commission's depreciation figures arrived at from study of company books by "cloistered" commission officials, together with inspection by commission engineers.

Answers to Traffic Questions on Page 18

1. Please refer to the preface for answer.
2. When you make a subsequent attempt to complete your call, the calling party or station will report that they have already talked on the call or the called station will report that the called party has talked on the call.
3. The time the first report is received is considered as equivalent to the filing time and would be used in challenging.
4. Not unless the calling party cancels the call.
5. Reach your toll center operator and, when she answers, request her to ring the operator at the calling point. When the operator at the calling point answers, say "O.K." and proceed as requested.

Hearing January 3 In Tulsa, Okla., Rate Case

Attorneys for the Southwestern Bell Telephone Co. and the Oklahoma Corporation Commission are scheduled to appear in Washington, D. C., January 3 to argue the right of the United States Supreme Court to review the decision of the Oklahoma Supreme Court approving a telephone rate reduction for Tulsa.

The telephone company appealed on the grounds that the 25-cent monthly reduction in residential telephone rates ordered for Tulsa amounted to confiscation of its property and was in violation of the federal constitution.

J. B. A. Robertson, attorney for the commission, filed a motion to dismiss on the grounds that the commission order was a legislative and not a judicial act, and, therefore, not subject to judicial review.

Attorneys for the telephone company contend that the decision of the court to allow argument on the motion shows that the highest court in the land regards the case as of great public interest and importance.

The questions in the Tulsa case are also raised in an appeal from a rate reduction ordered for Oklahoma City, and in rate cases affecting 60,000 subscribers in 17 smaller cities. The decision of the supreme court should go far toward settling the contentions in all of the cases.

Appeals Court Finds Intrastate Wire-tapping Legal

The denial by the United States Circuit Court of Appeals in New York City of a plea for bail in the June Reed Mann act violation case, on December 22, was interpreted by Seymour Klein, assistant U. S. attorney, as being in effect a ruling by that court that evidence obtained by wiretapping in intrastate matters may be legally received from federal officers in federal court.

In other words, the recent ruling of the U. S. Supreme Court that wiretapping is banned under the Communications Act of 1934 (TELEPHONY of December 25) applies only in cases of interstate commerce and government officers and police may continue to tap wires that do not cross state boundaries.

After hearing Attorney Klein present the Department of Justice's contention that Congress may regulate interstate commerce, but not intra-

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state matters, the Appeals Court declined to entertain a motion by Henry A. Uterhart, attorney for June Reed, for an order admitting his client to bail pending appeal from her recent conviction of violating the Mann act.

Miss Reed had been sentenced to four years in jail and her application for bail had been denied on the ground that she was not likely to obtain a reversal. Mr. Uterhart appeared before the circuit court, December 22, to point out that 100 pages of a 600-page record of testimony at her trial consisted of evidence gathered by wire-tapping.

"In view of the U. S. Supreme Court's decision," he said, "this matter raises an issue."

"If it were intrastate wire-tapping," said Judge Swan, "it would not be prohibited."

Mr. Uterhart said the government had introduced testimony against his client based on the tapping of wires in a conversation between New York and Miami.

Judge Learned Hand remarked that Miss Reed had been convicted on counts other than the one involved in the interstate conversation.

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Approval Granted Sale of Minnesota Properties

Clarence W. Orr, operating the Red Lake Falls Telephone Exchange with exchanges at St. Hilaire and Red Lake Falls, Minn., was authorized to sell the properties to the Red Lake Falls Telephone Co., a corporation, in an order issued December 9 by the Minnesota Railroad & Warehouse Commission.

The evidence in the case showed that the Red Lake Falls company was owner and operator of the properties in question up to March 3, 1937, on which date the properties were sold to Mr. Orr, who has since controlled and operated them.

Since such sale, the Red Lake Falls company testifies it has not been and is not now interested in or connected with any telephone company in the state or elsewhere; and that, upon the completion of this sale, it will operate the properties exclusively under the name of the Red Lake Falls Telephone Co., with principal offices at Red Lake Falls, Minn.

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